What is claimed is:

1. A system for modulating DS data on an I phase communicating DI data and on a Q phase communicating DQ data, the I phase and Q phase are phases of a modulated carrier signal communicating the DI data and the DQ data and the DS data, the carrier signal has a total phase equal to arctangent of the Q phase divided by the I phase, the system comprising,

an encoder for encoding the DI data and the DQ data respectively into an Io encoded signal and a Qo encoded signal,

an encoded subcarrier modulation signal generator for receiving one or more of the DS data and the DI data and the DQ data and for generating an encoded subcarrier modulation signal, the encoded subcarrier modulation signal comprises a product of a data partition function and the DS data, the data partition function is a function of one or more of the DI data and the DQ data and the DS data,

a modulator for modulating a subcarrier signal by the encoded subcarrier modulation signal for providing a modulated subcarrier signal, for modulating the total phase of the carrier signal by the modulated subcarrier signal, for modulating the I phase of the carrier signal by the Io encoded signal and by an I phase subcarrier signal to provide an I phase carrier signal and for modulating the Q phase of the carrier signal by the Qo encoded signal and by a Q phase subcarrier signal to provide a Q phase carrier signal, the modulator combining the Q phase carrier signal and the I phase carrier signal as a composite signal, the I phase subcarrier signal is an I intermodulation product of the

encoded subcarrier modulation signal and the Qo encoded signal, the Q phase subcarrier signal is a Q intermodulation product of the encoded subcarrier modulation signal and the Io encoded signal, the ratio of the Q intermodulation product over the I intermodulation product is equal to the ratio of the Io encoded signal over the Qo encoded signal, the composite signal has a constant amplitude envelop.

2. The system of claim 1, wherein

the encoder comprises:

a Q encoder for encoding the DQ data into the Qo encoded signal; and

an I encoder for encoding the DI data into the Io encoded signal,

the encoded subcarrier modulation signal generator comprises:

a data partition function generator for receiving one or more of the DI data and the DQ data and the DS data and for generating a data partition signal;

a modulo two mixer for mixing the data partition signal with the DS data into a modified DS data signal; and

a data encoder encoding the modified DS data signal into the encoded subcarrier modulation signal,

the modulator comprises:

a subcarrier generator for generating the subcarrier signal;

a multiplier for multiplying the subcarrier signal by a modulation index for generating a scaled subcarrier signal;

a scaling mixer for mixing the scaled subcarrier signal with the encoded subcarrier modulation signal for providing the modulated subcarrier signal;

a sine and cosine subcarrier processor for receiving the modulated subcarrier signal for generating a sine subcarrier signal and a cosine subcarrier signal, the sine subcarrier signal is modulated by the DS data, the cosine subcarrier signal is unmodulated by the DS data;

a carrier phase rotator for combining the sine subcarrier

signal and the cosine subcarrier signal with both of Io encoded signal and the Qo encoded signal and for providing I and Q rotated signals, the I rotated signal comprises a scaled Io encoded signal for communicating the DI data and comprises a scaled I phase subcarrier signal for communicating the DS data, the Q rotated signal comprises a scaled Qo encoded signal for communicating the DQ data and a scaled Q phase subcarrier signal for communicating the DS data, the scaled I phase and Q phase subcarrier signals are the I and Q intermodulation products and are generated when the sine and cosine subcarrier signals are rotated and combined with Io encoded signal to form the I rotated signal and when the sine and cosine subcarrier signals are rotated and combined with the Qo encoded signal to form the Q rotated signal, the scaled I phase and scaled Q phase subcarrier signals are orthogonal and are the I and Q intermodulation products of the Io and Qo encoded signals modulated by harmonics of the modulated subcarrier signal, the I and Q rotated signals are scaled by harmonics of the scaled subcarrier signal; and,

a quadrature modulator for receiving the I and Q rotated signals and the carrier signal for respective I and Q phase modulation of the carrier signal by the I and Q rotated signals to provide the composite signal having the I phase and Q phase, the DI data is communicated on the I phase of the composite signal, the DQ data is communicated on the Q phase of the composite signal, and the DS data is communicated on both of the I phase and Q phase of the composite signal, the constant amplitude envelope results from the I and Q phase modulation of

the carrier signal by the modulated subcarrier signal.

3. The system of claim 2, wherein the modulation index is less than or equal to $\pi/2$ radians.

4. The system of claim 1 wherein

the encoder comprises:

a Q encoder for encoding the Q data into the Qo encoded signal; and

an I encoder for encoding the I data into the Io encoded signal,

the encoded subcarrier modulation signal generator comprises:

a data partition function generator for receiving one or more of the DI data and the DQ data and the DS data for generating a data partition signal;

a modulo two mixer for mixing the data partition signal with the DS data into a modified DS data signal; and

a data encoder encoding the modified DS data signal into the encoded subcarrier modulation signal,

the modulator comprises:

a subcarrier generator for generating the subcarrier signal;

a subcarrier modulator for modulating the encoded subcarrier modulation signal onto the subcarrier signal to provide the modulated subcarrier signal;

a quadrature modulator for modulating Io encoded signal and

Qo encoded signal onto an IF signal for providing a quadrature IF signal;

a phase modulator having a modulation index for phase modulating an RF signal by the modulated subcarrier signal to provide a modulated subcarrier RF signal; and

a mixer for mixing the quadrature IF signal with the modulated subcarrier RF signal to provide the composite signal comprising the carrier signal that is a product of the IF signal and the RF signal.

5. The system of claim 4, wherein the subcarrier signal is a sinewave signal.

6. The system of claim 1, wherein,

the encoder is further for setting an I phase to Q phase power ratio of power of the Io encoded signal relative to power of the Qo encoded signal, and for further setting the same I phase to Q phase power ratio of power of the Q phase subcarrier signal relative to power of the I phase subcarrier signal, and the modulator is defined by a modulation index for setting a carrier to subcarrier power ratio between the power of Io and Qo encoded signals relative to the I phase and Q phase subcarrier signals.

7. The system of claim 1, wherein the subcarrier signal is a periodic signal.

8. A system for modulating DS data on an I phase communicating DI data and on a Q phase communicating DQ data, the I phase and Q phase are phases of a modulated carrier signal communicating the DI data and DQ data, the carrier signal has a total phase equal to arctangent of the Q phase divided by the I phase, the DI data is communicated in spread spectrum signals spread by an CI code, the DQ data is communicated in spread spectrum signals spread by an CQ code, the DS data is communicated in spread spectrum signals spread by an CS code, the DS data is subcarrier data and CS code is a subcarrier code, the system comprising,

an encoder for encoding the DI data spread by the CI code into an Io encoded signal, and for encoding the DQ data spread by the CQ code into a Qo encoded signal,

an encoded subcarrier modulation signal generator for receiving the DS data and the CS code and the DI data and the CI code and the DQ data and the CQ code and for generating an encoded subcarrier modulation signal, the encoded subcarrier modulation signal comprises a product of a data partition function and a code partition function and the DS data and the CS code, the data partition function is a function of one or more of the DI data and the QI data and the DS data, the code partition function is a function of one or more of the CI code and the CQ code and the CS code, and

a modulator for modulating a subcarrier signal by the encoded subcarrier modulation signal for providing a modulated subcarrier signal, for modulating the total phase of the carrier signal by the modulated subcarrier signal, for modulating the I phase of the carrier signal by the Io encoded signal and by an I

phase subcarrier signal to provide an I phase carrier signal and for modulating the Q phase of the carrier signal by the Qo encoded signal and by an Q phase subcarrier signal to provide a Q phase carrier signal, the carrier modulator combining the Q phase carrier signal and the I phase carrier signal as a composite signal, the Q phase subcarrier signal is a Q intermodulation product of the encoded subcarrier modulation signal and the Io encoded signal, the I phase subcarrier signal is an I intermodulation product of the encoded subcarrier modulation signal and the Qo encoded signal, the ratio of the Q intermodulation product over the I intermodulation product is equal to the ratio of the Io encoded signal over the Qo encoded signal, the composite signal has a constant amplitude envelop.

9. The system of claim 8, wherein,

the data partition function is an alpha function, the alpha function has a square identity, the alpha function is selected from a group consisting of a first alpha function equaling DI that equals DQ, a second alpha function equaling DS when DI equal to DQ, a third alpha function equaling DS when DI does not equal DQ, a fourth alpha function equaling one when DI does not equal DQ, and a fifth alpha function equaling one when DI equals DQ, and

the code partition function is a beta function, the beta function has a square identity, the beta function is selected from a group consisting of a first beta function equaling one, a second beta function equaling CI times CQ, a third beta function equaling CI, a fourth beta function equaling CQ, and a fifth beta function equaling CS.

10. The system of claim 8, wherein the encoder is further for setting a power ratio of the Io encoded signal relative to Qo encoded signals, and for setting the same power ratio of the Q phase subcarrier signal relative to the I phase subcarrier signal.

11. The system of claim 8, wherein the modulator is defined by a modulation index for setting a power ratio between power of Io and Qo encoded signals relative to power of the Q phase and I phase subcarrier signals.

12. The system of claim 11, wherein power of the Q phase and I phase subcarrier signals is less than power of the Io and Qo encoded signals modulated on the carrier signal.

13. The system of claim 8, wherein the modulator comprises,

a subcarrier generator for generating the subcarrier signal;

a subcarrier modulator for modulating the encoded subcarrier modulation signal onto the subcarrier signal to provide a modulated subcarrier signal;

a quadrature modulator for modulating Io encoded signal and Qo encoded signal onto an IF signal for providing a quadrature IF signal;

a phase modulator having a modulation index for phase modulating an RF signal by the modulated subcarrier signal to provide a modulated subcarrier RF signal; and

a mixer for mixing the quadrature IF signal with the modulated subcarrier RF signal to provide the composite signal comprising the carrier signal that is a product of the IF signal and the RF signal.

14. The system of claim 8, wherein the encoder comprises,

a Q mixer for spreading the DQ data by the CQ code to provide a DCQ spread spectrum signal,

a Q encoder for encoding the DCQ spread spectrum signal into the Qo encoded signal,

a Q amplifier for setting a Q power level of the Qo encoded signal,

an I mixer for spreading the DI data by the CI code to

provide a DCI spread spectrum signal,

an I encoder for encoding the DCI spread spectrum signal into the Io encoded signal, and

an I amplifier for setting an I power level of the Io encoded signal.

15. The system of claim 14, wherein the I power level does not equal the Q power level.

16. The system of claim 8, wherein the encoded subcarrier modulation signal generator comprises,

a data partition function generator for receiving one or more of the DS data and the DI data and the DQ data and for generating a data partition signal,

a code partition function generator for receiving one or more of the CS code and the CI code and the QI code and for generating a code partition signal,

a data mixer for modulo two mixing the DS data and the data partition signal into a modulo two data signal,

a code mixer for modulo two mixing the CS code and the code partition signal into a modulo two code signal,

a modulo two mixer for modulo two mixing the modulo two data signal with the modulo two code signal for providing a modified subcarrier data signal, and

a data encoder for encoding the modified subcarrier data signal into the encoded subcarrier modulation signal.

17. The system of claim 8, wherein the modulator comprises,

a subcarrier generator for generating the subcarrier signal;

a multiplier for multiplying the subcarrier signal by a modulation index for generating a scaled subcarrier signal;

a scaling mixer for mixing the scaled subcarrier signal with the encoded subcarrier modulation signal for providing a modulated subcarrier signal;

a sine and cosine subcarrier processor for receiving the modulated subcarrier signal for generating a sine subcarrier signal and a cosine subcarrier signal, the sine subcarrier signal is modulated by the DS data, the cosine subcarrier signal is unmodulated by the DS data;

a carrier phase rotator for combining the sine subcarrier signal and the cosine subcarrier signal with both of Io encoded signal and the Qo encoded signal and for providing I and Q rotated signals, the I rotated signal comprises a scaled Io encoded signal for communicating the DI data and comprises a scaled I phase subcarrier signal for communicating the DS data, the Q rotated signal comprises a scaled Qo encoded signal for communicating the DQ data and a scaled Q phase subcarrier signal for communicating the DS data, the scaled I phase and Q phase subcarrier signals are the I and Q intermodulation products and are generated when the sine and cosine subcarrier signals are rotated and combined with Io encoded signal to form the I rotated signal and when the sine and cosine subcarrier signals are rotated and combined with the Qo encoded signal to form the Q rotated signal, the scaled I phase and scaled Q phase subcarrier signals are orthogonal and are the I and Q intermodulation

products of the Io and Qo encoded signals modulated by harmonics of the modulated subcarrier signal, the I and Q rotated signals are scaled by harmonics of the scaled subcarrier signal; and

a quadrature modulator for receiving the I and Q rotated signals and the carrier signal for respective I and Q phase modulation of the carrier signal by the I and Q rotated signals to provide the composite signal having the I phase and Q phase, the DI data is communicated on the I phase of the composite signal, the DQ data is communicated on the Q phase of the composite signal, and the DS data is communicated on both of the I phase and Q phase of the composite signal, the constant amplitude envelope results from the I and Q phase modulation of the carrier signal by the modulated subcarrier signal.

18. The system of the claim 17, wherein the subcarrier signal is a squarewave.

19. The system of claim 8, wherein the modulator comprises,

a subcarrier generator for generating the subcarrier signal;

a multiplier for multiplying the subcarrier signal by a modulation index for generating a scaled subcarrier signal;

a scaling mixer for mixing the scaled subcarrier signal with the encoded subcarrier modulation signal for providing a modulated subcarrier signal;

a sine and cosine subcarrier processor for receiving the modulated subcarrier signal for generating a sine subcarrier

signal and a cosine subcarrier signal, the sine subcarrier signal is modulated by the DS data, the cosine subcarrier signal is unmodulated by the DS data;

a carrier phase rotator for combining the sine subcarrier signal and the cosine subcarrier signal with both of Io encoded signal and the Qo encoded signal and for providing I and Q rotated signals, the I rotated signal comprises a scaled Io encoded signal for communicating the DI data and comprises a scaled I phase subcarrier signal for communicating the DS data, the Q rotated signal comprises a scaled Qo encoded signal for communicating the DQ data and a scaled Q phase subcarrier signal for communicating the DS data, the scaled I phase and Q phase subcarrier signals are the I and Q intermodulation products and are generated when the sine and cosine subcarrier signals are rotated and combined with Io encoded signal to form the I rotated signal and when the sine and cosine subcarrier signals are rotated and combined with the Qo encoded signal to form the Q rotated signal, the scaled I phase and scaled Q phase subcarrier signals are orthogonal and are the I and Q intermodulation products of the Io and Qo encoded signals modulated by harmonics of the modulated subcarrier signal, the I and Q rotated signals are scaled by harmonics of the scaled subcarrier signal, the sine subcarrier signal comprises modulation index scaled, subcarrier data modulated, odd subcarrier harmonic signals, the cosine subcarrier signal comprises modulation index scaled even subcarrier harmonic signals, the modulation index is set to a predetermined value to weight subcarrier harmonics to set power of the carrier signal relative to the subcarrier signal while

maintaining the constant envelop of the composite signal; and

a quadrature modulator for receiving the I and Q rotated signals and the carrier signal for respective I and Q phase modulation of the carrier signal by the I and Q rotated signals to provide the composite signal having the I phase and Q phase, the DI data is communicated on the I phase of the composite signal, the DQ data is communicated on the Q phase of the composite signal, and the DS data is communicated on both of the I phase and Q phase of the composite signal, the constant amplitude envelope results from the I and Q phase modulation of the carrier signal by the modulated subcarrier signal.

20. The system of claim 19, wherein the modulated subcarrier signal is equal to the modulation index multiplied by the DS data by the data partition function by the code partition function by CS code and by the subcarrier signal.